NAVAL FUTURE FORCE
SCIENCE AND TECHNOLOGY EXPO

Innovative Technology Programs

Dr. Thomas Killion
Director of Technology (03T)
February 4, 2015

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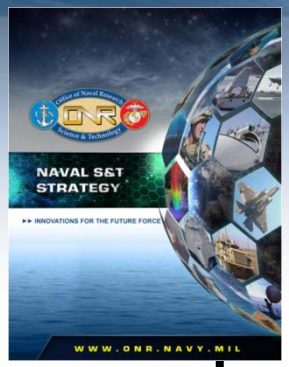
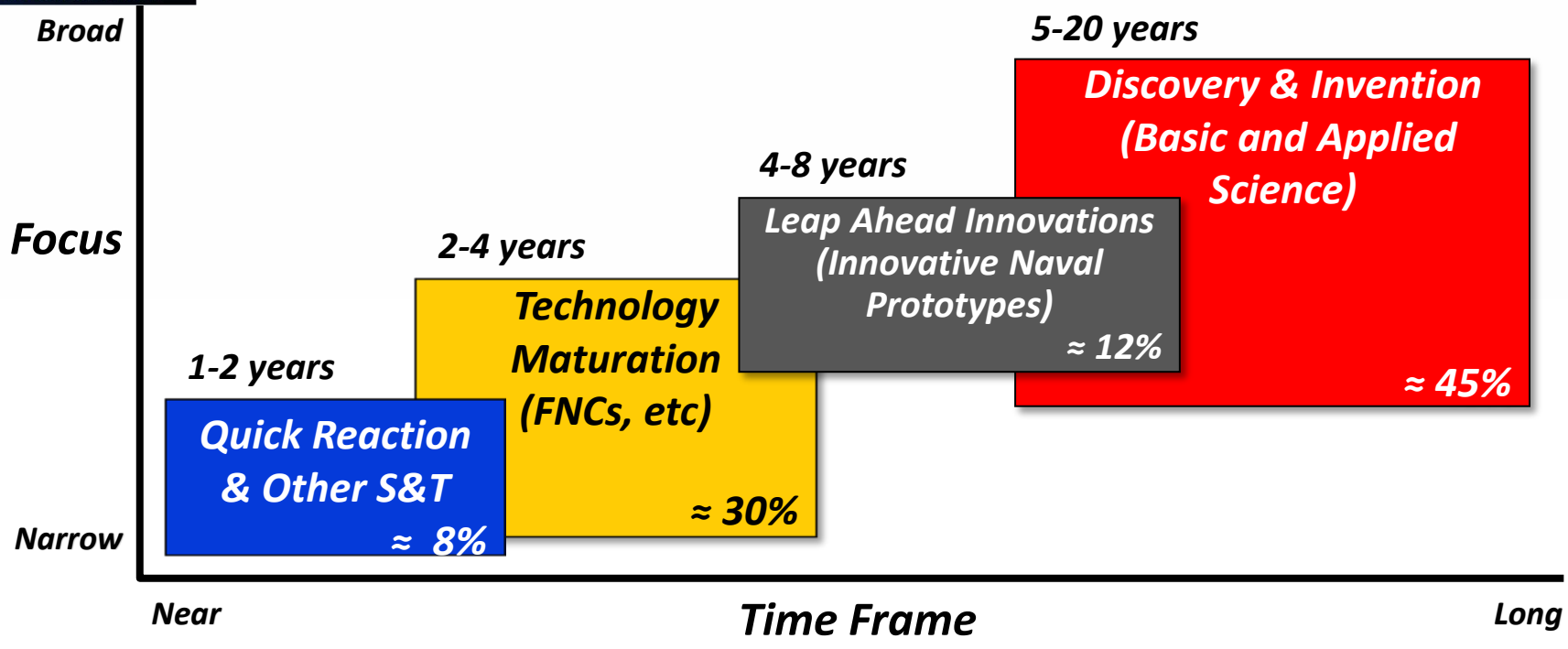
Naval S&T Strategy



- *Assure Access to Maritime Battlespace*
- *Autonomy & Unmanned Systems*
- *Electromagnetic Maneuver Warfare*
- *Expeditionary & Irregular Warfare*
- *Information Dominance/Cyber*
- *Platform Design & Survivability*
- *Power & Energy*
- *Strike & Integrated Defense*
- *Warfighter Performance*



≈50% of the portfolio is focused on near and mid-term capabilities

ONR Organization

Chief of Naval Research ★★
Exec. Director

N84M | NRL | ACNR | AVCNR

Vice Chief of Naval Research ★

PMR -51 | ONRG | BIZOPS | Comptroller

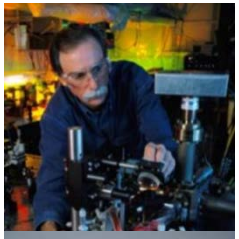
Code 30	Code 31	Code 32	Code 33	Code 34	Code 35
Expeditionary Warfare	C4ISR	Ocean Battlespace Sensing	Sea Warfare & Weapons	Warfighter Performance	Naval Air Warfare & Weapons

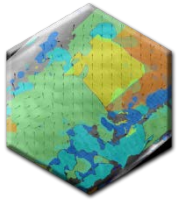
Office of Research (03R)

Office of Technology (03T)

Discovery & Invention • Education Programs
SwampWorks

Transition Products • Disruptive Technologies
SBIR • Affordability Initiatives





ONR Organization: Directorate of Technology

Chief of Naval Research ★★
Exec. Director
Vice Chief of Naval Research ★

N84M | NRL | ACNR | AVCNR
PMR -51 | ONRG | BIZOPS | Comptroller

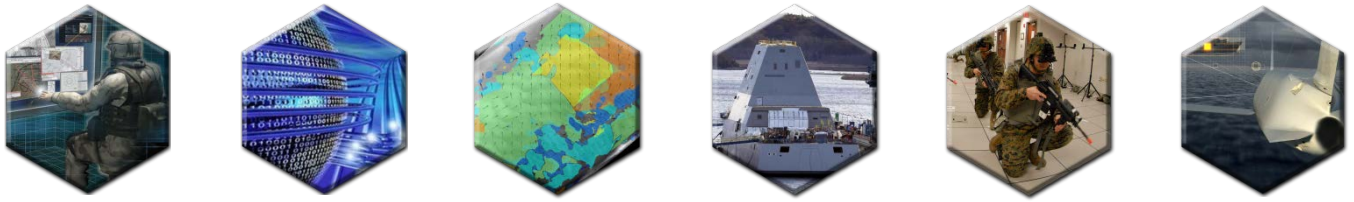
- **Code 30** Expeditionary Warfare
- **Code 31** C4ISR
- **Code 32** Ocean Battlespace Sensing
- **Code 33** Sea Warfare & Weapons
- **Code 34** Warfighter Performance
- **Code 35** Naval Air Warfare & Weapons

Office of Research (03R)

Discovery & Invention • Education Programs
SwarmWorks

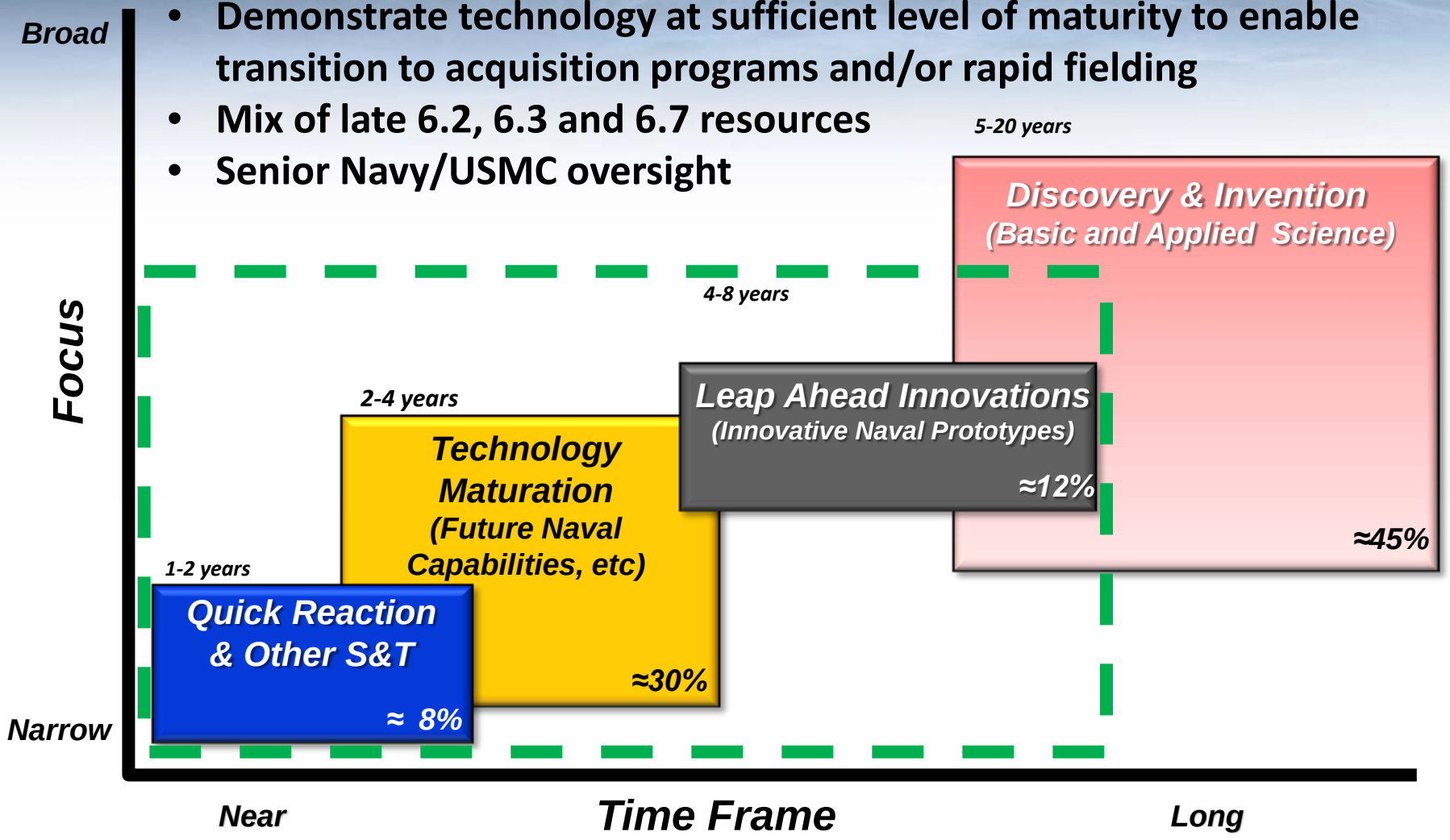
Office of Technology (03T)

Transition Products • Disruptive Technologies
SBIR • Affordability Initiatives

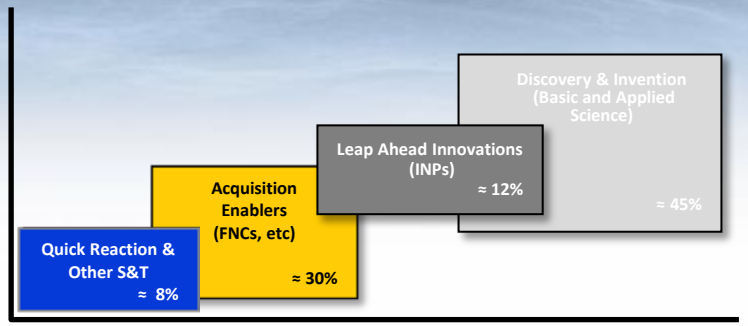


Director of Technology Focus

- Demonstrate technology at sufficient level of maturity to enable transition to acquisition programs and/or rapid fielding
- Mix of late 6.2, 6.3 and 6.7 resources
- Senior Navy/USMC oversight



Directorate of Technology Mission



The Directorate of Technology promotes, fosters, and develops innovative Science & Technology with a focus on transition to acquisition.

Technology Directorate (03T)

Future Naval Capabilities

(Mike Meyers)

- Management oversight of the FNC program to ensure that all FNC investments are executed in accordance with TOG/CNR priorities

Disruptive Technologies

(Bob Smith)

- Coordination and Execution Monitoring of INPs, Tech Solutions, Speed-to-Fleet, Rapid Innovation Fund (RIF)

Affordability Initiatives

(John Carney)

- Execution of Manufacturing Technology
- Coordination and Execution Monitoring of Technology Insertion for Program Savings (TIPS)
- Coordination and Execution Monitoring Tech Transfer / FCT / DPSI

SBIR/STTR

(Bob Smith, Acting Director)

- Management control of DON SBIR/STTR
- Execution Oversight of ONR SBIR/STTR

Visit 03T Directors and staff in Room 203 A&B

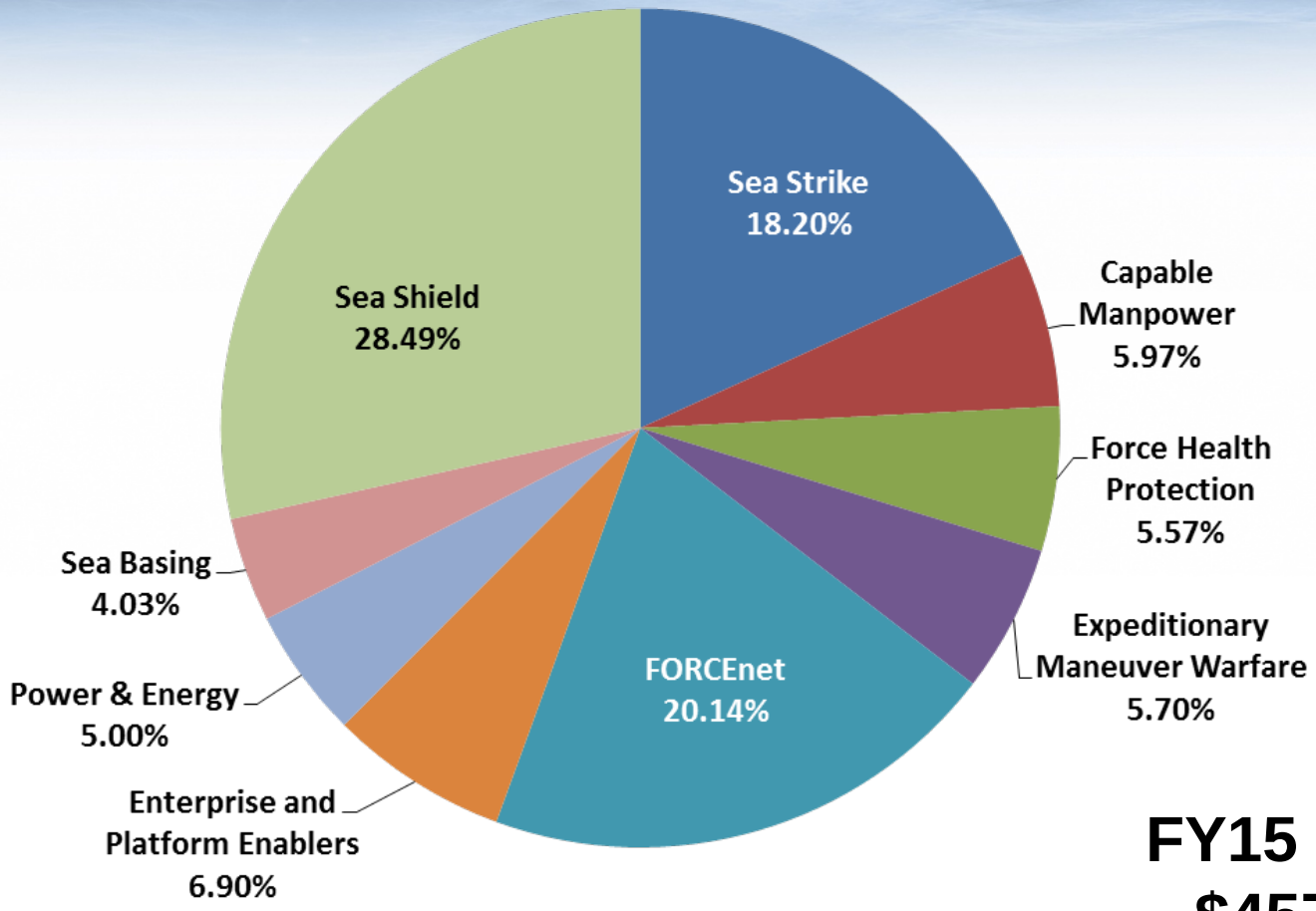
Future Naval Capabilities (FNC)

Delivers S&T products to acquisition programs of record

- Addresses the urgent needs of the Fleet/Force
- 3-star Flag/General Officer-level review & approval
- Assessed annually for technical merit and transition alignment
- Demonstrates a prototype within 2-4 years
- 55% industry & 10% academia participation

Requirements Driven – Transition Oriented

FNC Investment by Pillar



FY15 Total
$457M*

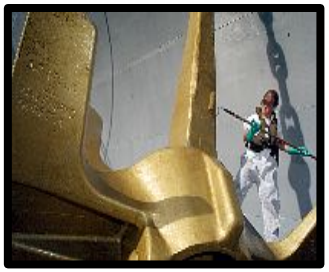
Shifts Based on the Annual Product Composition

*New Starts and existing Products

FNC Program Delivers Mature Products to the Fleet/Force

EPE-FY09-08
Maintenance Reduction Technologies

- Corrosion control and prevention technologies that significantly improve the operational readiness and service life of assets. Examples include Topside Coatings, Airfield Pavements, Nonskid Coatings, and Ship Rudder Coatings



- Transitioned to the Fleet via Qualified Product Database.
- **Provides an estimated Net Present Value of $1,052M over 30 years after an initial S&T investment of only $20M.**

EMW-FY06-01
Advanced Power Generation

Improved power system technologies with reduced logistical footprints for Marines in forward operating locations. Examples include Ground Renewable Expeditionary Energy System (GREENS), and Man-Portable JP-8 Fueled Generator.

- Transitioned to Alternative Power Sources for Communications Equipment Program, MCSC.
- **Lessens the need for costly, and often dangerous, resupplies of Marines in forward positions.**

Approved FY16 New Starts

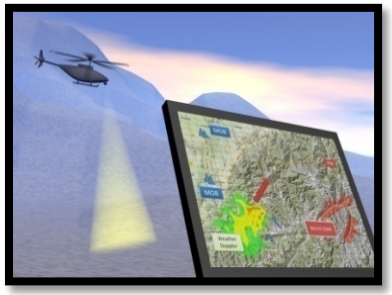
Future Naval Capability (FNC) Title	Pillar
Operational Planning Tool	Capable Manpower
Densified Propellant Fire From Enclosure - Confined Space (FFE/CS) Propulsion Technologies	Expeditionary Maneuver Warfare
Advanced Topcoat System (ATS)	Enterprise & Platform Enablers
Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool (I-PREDICT)	Force Health Protection
Combined EO/IR Surveillance and Response System (CESARS)	FORCEnet
Ship-launched EW Extended Endurance Decoy (SEWEED)	Sea Shield
Surface Ship Periscope Detection and Discrimination (SSPDD)	Sea Shield
Softkill Performance and Real-Time Assessment (SPARTA)	Sea Shield
Reactive Electronic Attack Measures (REAM)	Sea Strike

Unfunded FY16 New Starts of Interest to ONR

Future Naval Capability (FNC)	Pillar
Multi-Threat Passive Ship Armor	Enterprise & Platform Enablers
Operate to Know (OtK)	FORCEnet
Combat Power Control	Power & Energy
Persistent Renewable Energy for Undersea Systems (PREUS)	Power & Energy
Autonomous Unmanned Surface Vehicles for MiW Operations	Sea Shield
Surface X-Band Radar (Surf-X)	Sea Shield
Autonomous Reacquisition Manipulator System (ARMS)	Sea Shield
Mine Drift Prediction Tactical Decision Aid (MDP TDA)	Sea Shield

Innovative Naval Prototypes (INP)

Develop disruptive technologies that are high risk or game changing to produce higher warfighting payoff



- **Game changing or disruptive**
  - Dramatically changes the way naval forces fight
  - Radical departure from established requirements and concepts of operation
  - Expected to demonstrate/prototype a transitionable warfighting capability in four-eight years
- **Deliver the "Next Big Thing"**

Current INPs and Pending FY16 New Starts

Current Active INPs:

- Electromagnetic Railgun (EMRG)
- Integrated Topside (INTOP)
- Autonomous Aerial Cargo Unmanned System (AACUS)
- Large Displacement Unmanned Underwater Vehicle (LDUUV)
- Netted Emulation of Multi Element Signatures Against Integrated Sensors (NEMESIS)

FY16 New Start INPs*

- Electromagnetic Maneuver & Control Capability (EMC2);
- Forward Deployed Energy & Communications Outpost (FDECO)

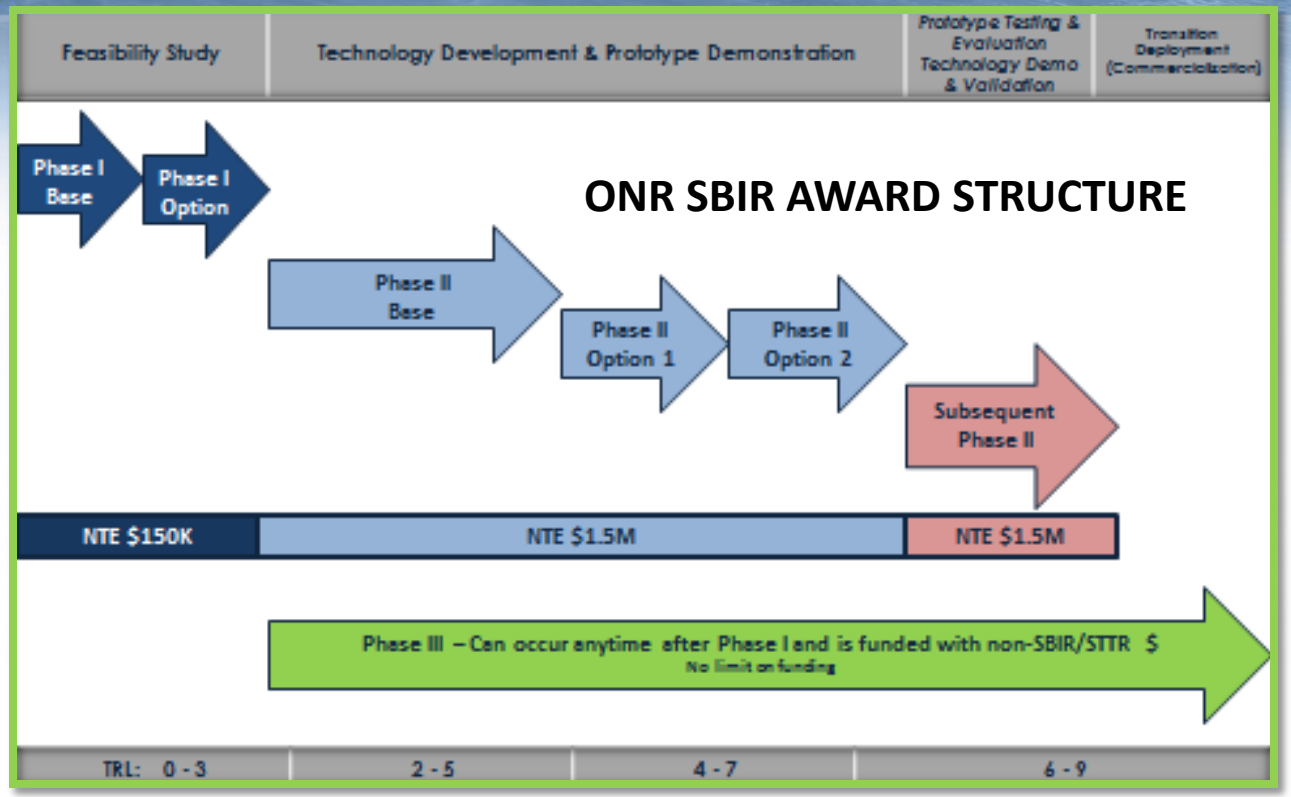
*Pending decision by Naval Research, Development, Test, and Evaluation (RDT&E) Corporate Board

Small Business Innovation Research (SBIR)
Small Business Technology Transfer (STTR)

Primary Program Goal

Use small business to develop innovative R&D that addresses DON needs

www.navysbir.com



Basic Process

Topics: Posted 3 times/year on DoD SBIR/STTR website (www.dodsbir.net)

Current Solicitation Open until 18 Feb 15

Phase I: Feasibility of technology

Phase II: Mature technology & develop prototypes

Subsequent Phase II: Continue technology development; transition potential

Phase III: Transition/Deployment (Commercialization)

Current SBIR and STTR Solicitations

SBIR 2015.1 and STTR 2015A Solicitations:

DoN investment FY14:
SBIR - $233M
STTR - $35M

- pre-released by DoD in December 2014
- began receiving proposals in January 2015
- currently ***open to receive proposals until February 18, 2015*** at 6:00am ET
- inclusive of various topics from multiple Navy SYSCOMS (ONR, NAVAIR, NAVSEA, MARCOR, SPAWAR).

Additional solicitations in April and August 2015

www.navysbir.com

2015 NAVY Opportunity Forum – June 1-3, 2015 – Hyatt Regency, Crystal City, VA

ManTech Investment Strategy

- **Addressing affordability (acquisition and life-cycle)**

Affordability Initiatives									
PEO (Subs) *VIRGINIA ORP*	PEO (Ships) *DDG 51 Class*	PEO (Carriers) *CVN 78 Class*	PEO (JSF) *F-35*	PEO (A) *CH-53K*

- **Investment Strategy focused on largest DoN acquisition programs as determined by:**
  - Total acquisition funding
  - Stage in acquisition cycle (remaining years of acquisition)
  - Platform cost reduction goals
  - Cost reduction potential for manufacturing

- **Recent Changes**
  - Addition of CH-53K

ManTech - making a significant impact on affordability, highlighted by recent implementations and cost savings

VIRGINIA Class Submarine Affordability Initiative

On track to save nearly $500M with current portfolio of approx. $69M

- **Projected acquisition savings: $36.5M/hull**
  - Cost savings to date: $32.4M/hull
  - 36 implemented projects per Electric Boat (8/2014)
- **Projected class maintenance/repair cost savings: $100+M**

Won 2013 DOD Value Engineering Achievement Award

- Letter of appreciation from HON Frank Kendall, USD (AT&L) – Jun 2014
- Presented to ONR ManTech, VCS Production Cost Reduction Team (PMS 450), and Electric Boat – Oct 2014

Annual Navy ManTech Budget returned with yearly VCS cost savings of >$60M

Summary

- **03T portfolio is focused on maturing technology to enable transition to acquisition**

- **Transition is a contact sport**
  - Engage the customer early
  - Document, document, document!

- **Metrics drive performance**
  - Apply best practices and measure systematically
  - Adapt to the nature of the program being measured
  - Use the data to make hard decisions

www.onr.navy.mil

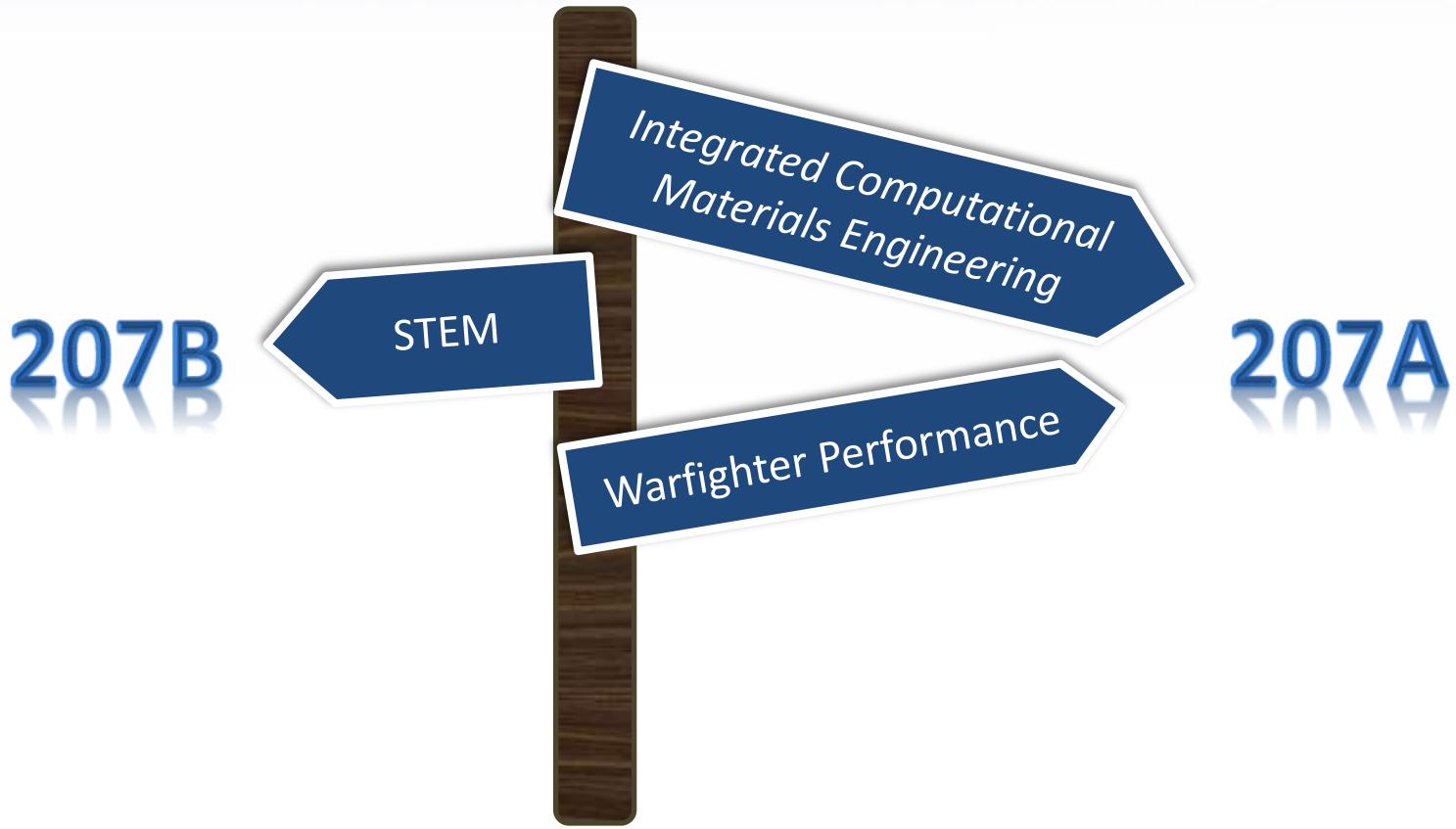
Director of Technology

Dr. Thomas Killion

thomas.killion@navy.mil

Visionary Rooms

Coming up next…



Integrated Computational Materials Engineering

1030-1115 & 1115-1200 Room 207A

Integrated Computational Materials Design: From Genome to Flight

Dr. Greg B. Olson

Walter P. Murphy Professor of Materials Science and Engineering and Applied Science

Northwestern University

A Multidisciplinary Approach to the Design and Development of Advanced Electrochemical Energy-Conversion Technologies

Dr. Robert Kee

George R. Brown Distinguished Professor

Colorado School of Mines

Dr. Julie Christodoulou, Director, Naval Materials S&T (Code 33)

Warfighter Performance

1300-1345 Room 207A

Human Robot Interaction

Dr. Tom McKenna
Program Officer, ONR

Information Technology and the New Threat Environment

Dr. Rebecca Goolsby
Program Officer, ONR

Dr. Terry Allard, Head, Warfighter Performance

Perspectives on Naval STEM
Room 207B

10:15	Intro to Naval STEM	Dr. Larry Schuette, *Office of Naval Research*
10:45	Naval Research Enterprise Best Practices Panel	Michael Ferraro, *Marine Corps Systems Command* Dr. Jim Rohr, *Space and Naval Warfare Systems Command* Dr. Angie Moran, *United States Naval Academy*
11:30	VIP Perspective	Dr. Bob Ballard, *Oceanographer and Explorer*
12:15	Student Perspectives Panel	Denzel Evans-Bell, *Louisiana State University* Dr. Brandon Cochenour, *Naval Air Systems Command* Dr. Morgan Parker, *Naval Sea Systems Command*
13:00	ONR STEM Grant Principal Investigator Panel	Dr. William Kiser, *Pennsylvania State University* Dr. Peter Tkacik, *University of North Carolina, Charlotte* Dr. Curtis Charles, *Fayetteville State University* Dr. Isabel Cardenas-Navia, *Business-Higher Education Forum*